

REMARKS

Claims 13-20 remain pending in the application.

Applicants thank Examiner Chaudhuri for the courtesy of a personal interview regarding this application on 24 February 2004. As a result of that interview, Applicants understand that the claim amendments made by this Amendment overcome the previous rejections of claims 13-20, as discussed in further detail below.

35 U.S.C. § 103

The FINAL Office Action rejected claims 13-18 under 35 U.S.C. § 103 as allegedly being unpatentable over Larson et al. U.S. Patent 5,206,788 (“Larson”) in view of Desu et al. U.S. Patent 5,817,170 (“Desu”). Applicants respectfully traverse those rejections for at least the following reasons.

Among other things, the method of claim 13 includes:

“forming on the ferroelectric layer an upper seed layer for forming a Perovskite crystal structure of the ferroelectric layer.”

As explained in the specification, during a subsequent annealing step, the upper **seed layer** becomes crystallized before the ferroelectric layer does (page 8, lines 18-20; page 9, lines 12-14; page 14, lines 7-8), to thereby act as a **seed layer** (page 16, lines 8-9) for the **subsequent crystallization** of the ferroelectric layer. The upper and lower seed layers together insure that crystallization proceeds uniformly from the **upper and lower surfaces** of the ferroelectric layer toward the middle (page 9, lines 14-15; page 13, lines 19-21; page 14, lines 9-10; page 16, lines 12-14), such that characteristics of the upper and lower interfaces of the ferroelectric layer match each other (page 4, lines 5-7; page 6, lines 4-5; page 8, lines 15-17; page 9, lines 1-2; page 14, lines 1-2, 10-11; page 16, lines 14-16). This prevents the so-called imprint

phenomenon caused by a difference in characteristics between: (A) an upper interface between the upper metal layer and the ferroelectric layer, and (B) a lower interface between the lower metal layer and the ferroelectric layer (page 3, lines 3-6; page 6, lines 4-7; page 8, lines 14-15; page 11, lines 2-3; page 16, lines 9-10).

Applicants respectfully submit that neither Larson nor Desu discloses forming any upper seed layer for forming a Perovskite crystal structure of an underlying ferroelectric layer.

The Office Action admits that Larson does not disclose an upper seed layer. However, the Office Action states that Desu discloses “forming an upper seed layer (40).”

Applicants respectfully disagree.

Reference numeral (40) in Desu designates a “**capping layer**,” (see, e.g., col. 4, lines 52-53) not an upper **seed** layer. Indeed, Desu carefully distinguishes between a **seeding layer** (layer (20)) and a capping layer (layer (40)). Desu teaches that the **capping layer** (40) (which is disclosed to be lead oxide) is provided to prevent loss of PB content in the underlying PZT film during post-deposition annealing (see, e.g., col. 2, lines 40-49, 64-65). Desu does not disclose that the capping layer (40) performs any seeding for the formation of the perovskite structure of the underlying PZT film (30). This should be contrasted to the detailed discussion in Desu of the seeding operation of the (lower) **seeding layer** (20) (see, e.g., col. 6, lines 17-39).

In the FINAL Office Action, Examiner Estrada cited Kim for the proposition that Desu’s capping layer is inherently a seed layer. As a result of the Examiner interview between Examiner Chaudhuri and the undersigned attorney on 24 February 2004, Applicants believe that the Examiner agrees that Kim does not disclose or suggest that the upper layer used by Desu is inherently an upper seed layer for forming a Perovskite crystal structure of an underlying ferroelectric layer, as claim 13 has been amended to more explicitly recite.

Therefore, for at least the foregoing reasons, it is not possible for any combination of Larson and Desu to produce the method of claim 13. Accordingly, it is respectfully requested that the rejection of claim 13 based on Larson and Desu be withdrawn.

Claims 14-18

Claims 14-18 depend from claim 13 are deemed to be allowable for at least similar reasons to those set forth above with respect to claim 13, and for the following additional reasons.

Claim 15

Among other things, the method of claim 15 includes a feature of forming lower and upper seed layers using a material ***having a crystallization temperature lower than that of a material for forming the ferroelectric layer.***

The Office Action stated that Desu discloses such a feature.

Applicants respectfully disagree. The cited text at col. 4, line 59 - col. 5, line 7 does not disclose that the material for forming the upper layer in Desu has a lower crystallization temperature than the crystallization temperature of the material of the underlying ferroelectric layer.

Accordingly, for at least this additional reason, Applicants respectfully submit that claim 15 is patentable over the cited prior art.

Claim 16

Among other things, the method of claim 16 includes a feature of forming lower and upper seed layers using a ferroelectric material ***having a lattice constant similar to that of a material for forming the ferroelectric layer.***

The Office Action stated that Desu discloses such a feature.

Applicants respectfully disagree. Indeed, the Office Action has failed to cite any Figure or text anywhere in Desu where it is alleged that such a feature is disclosed.

In the FINAL Office Action, Examiner Estrada argues that Applicants have not established the range recited through the use of “similar” excludes the difference in lattice constants between the materials disclosed in Desu.

Applicants respectfully submit that it is not the Applicants burden to prove why a claim is patentable over a cited reference, but rather it is the Examiner’s burden to show why a claim is not patentable. In this regard, Applicants respectfully submit that FINAL Office Action failed to even cite any text in Desu disclosing any lattice constants that the Examiner believes are similar, within the meaning of claim 16. The Applicants cannot possibly rebut what the Examiner has not put forward in terms of evidence! It is the Applicants position that the Office Action has not cited any disclosure in Desu of any lattice constants that the Examiner was alleging are “similar,” and that until such a disclosure is cited to Applicants, no *prima facie* case of obviousness can possibly exist to be rebutted by Applicants.

Furthermore, Applicants also respectfully note that at no time during any of the four previous Office Action for this application has it ever been stated or alleged that the term “similar” in claim 16 is in any way unclear or vague, as Applicants indeed maintain that it is not.

Applicants respectfully request that a citation be provided to something in Desu disclosing the lattice constants of the two materials that are purported to be similar, within the meaning of claim 16, or that the rejection of claim 16 be withdrawn.

Claims 19-20

The Examiner rejected claims 19-20 under 35 U.S.C. § 103 as allegedly being unpatentable over Larson and Desu in view Hsu et al. U.S. Patent 6,048,738 (“Hsu”). The Examiner has cited Hsu solely for the switching element noted as missing in Larson and Desu. However, Applicants respectfully submit that Hsu fails to cure the other defects in Larson and Desu discussed above with respect to claim 13 from

which claims 19 and 20 depend. Accordingly, it is respectfully submitted that claims 19 and 20 are patentable over any combination of Larson, Desu and Hsu.

CONCLUSION


In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 13-20, and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (703) 715-0870 to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,

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